

Amendments to the Specification

Please insert the following header and paragraph on page 1, immediately following the title:

--Cross-Reference to Related Applications

This is the U.S. National Stage of International Application No. PCT/US03/11562, filed April 15, 2003, which was published under PCT Article 21(2), which in turn claims the benefit of United States Provisional Application No. 60/372,848 filed April 15, 2002. Both of these prior applications are incorporated by reference herein.--

Please insert the following Abstract on a separate page at the end of the application. A copy of the Abstract on a separate sheet also is provided.

**-- METHODS FOR SEPARATION AND DETECTION OF KETOSTEROIDS AND
OTHER CARBONYL-CONTAINING COMPOUNDS**

Abstract

Methods for enhancing detection by mass spectroscopy (MS) and/or chromatographic separability of carbonyl-containing compounds such as steroids are disclosed. Reaction of a carbonyl compound with a sulfonylhydrazide compound provides a sulfonylhydrazone with enhanced ionization efficiency during the electrospray ionization process. In a particularly disclosed embodiment, derivatization of catechol estrogens with p-toluenesulfonylhydrazide enhances both detection by atmospheric pressure ionization-MS (API-MS), such as electron spray ionization-MS (ESI-MS) and separation by liquid chromatography (such as HPLC) under reverse phase conditions. In yet other embodiments, the sulfonylhydrazone is further reacted with a sulfonyl halide under alkaline conditions to derivatize hydroxyl groups in the compound. Prior formation of the sulfonylhydrazide derivative protects the carbonyl bond of the compound during subsequent alkaline reaction with the sulfonyl halide.--